

APPENDIX A

NUCLEAR, BIOLOGICAL, AND CHEMICAL
OPERATIONS

Because many potential adversaries have the capability to employ chemical and nuclear weapons, scouts must prepare to fight in an NBC environment. Collecting, processing, and disseminating needed NBC hazard information are also vital. To survive and remain effective on the integrated battlefield the scout platoon must be proficient in the three fundamentals of NBC defense: contamination avoidance, protection, and decontamination.

Additional-duty NBC personnel should be designated by the platoon SOP for operations in an NBC environment. The crews of the team leaders' vehicles should be designated and trained as chemical agent detection and radiological survey and monitoring teams. The squad leaders' crews should be designated as decontamination teams and trained to operate all decontamination equipment organic to the battalion or squadron.

CONTENTS	
	PAGE
SECTION I. Contamination Avoidance	A-1
II. Protection	A-7
III. Decontamination	A-21
IV. The NBC Reconnaissance Platoon	A-24
V. Reconnaissance and Security in an NBC Environment	A-30

Section I. CONTAMINATION AVOIDANCE

Avoidance is the most important fundamental of NBC defense because the best way to survive is to avoid being the object of a chemical or nuclear attack. Avoiding contaminated areas minimizes the risk of additional casualties and the

degradation of combat power caused by operating in MOPP level 3 or 4 for extended periods of time. In addition, the unit is not required to spend the time and resources needed for decontamination. Contamination avoidance measures include using passive avoidance measures, locating contaminated areas, identifying NBC agents, warning other members of the platoon as well as other units, and reporting NBC threats to higher headquarters.

Passive avoidance measures can decrease the possibility of NBC attack or reduce the effects of an attack already underway. Effective use of concealment, dispersion, prepared positions, OPSEC, and signal security lessen the chances of being acquired as a target. The scout platoon should continually analyze its vulnerability to chemical or nuclear attack and take appropriate protective measures.

Attacks and contamination must be detected quickly and reported to adjacent units and headquarters elements. The scout platoon must have an effective method of quickly passing the alarm in the event of an NBC attack. The alarm could be passed by radio, audible signals, or hand-and-arm signals. The SOP should specify automatic procedures for employing detection teams and submitting the required NBC reports after an NBC attack or when contamination is encountered.

All movement routes and future positions should be reconnoitered for nuclear and chemical contamination whenever possible. Reconnaissance and quartering parties should be prepared to encounter, detect, identify, report, and mark contamination. By finding the location and type of hazard (nuclear radiation or chemical agent), the scout platoon can determine the best plan for bypassing, crossing, or operating in the hazard. The platoon must be prepared to locate and evaluate the hazard based on available information from fallout predictions (simplified and detailed), chemical downwind hazard predictions, monitoring data, and contamination overlays. Based on the situation, the platoon leader and parent unit commander must be able to implement protective measures specified in the SOP to minimize personnel losses and limit the spread of contamination.

DEFENSE BEFORE A NUCLEAR ATTACK

The best defense against a nuclear attack is to dig in. Unit defensive positions, which vary from individual foxholes to improved defensive positions, should be prepared whenever the tactical situation permits.

Scouts should keep their individual weapons, equipment, clothing, and other issue items in their vehicles. Equipment must be secured because the blast

wave will convert unsecured items into lethal missiles. Supplies, explosives, and flammables should be dispersed and protected.

Reverse slopes of hills and mountains give some nuclear protection. The initial radiation and the heat and light from the fireball of a nuclear blast tend to be absorbed by hills and mountains. The use of gullies, ravines, ditches, natural depressions, fallen trees, and caves can reduce nuclear casualties.

Tables A-1 through A-3 outline the protective measures to be taken in each of the three nuclear defense levels (A, B, C).

Table A-1. Nuclear defense level A.

NUCLEAR DEFENSE LEVELS LEVEL A - POSSIBLE	
OFFENSE	DEFENSE
PERSONNEL Inform personnel and continue with mission.	Inform personnel. Increase priority of preparing fighting positions with at least 18 inches of dirt overhead cover. Remain near fighting positions or vehicles.
RADIOS Turn off all nonessential radios. Disconnect antennas and matching unit cables of unused radios.	Turn off all nonessential radios. Disconnect antennas and matching unit cables of unused radios. Use wire or messenger whenever possible.
EQUIPMENT Secure all loose equipment. Close and latch all hatches not required to be open. Turn off all electrical equipment when not in use.	Secure equipment by tying it down or placing it inside the vehicle or fighting position. Close and latch all hatches not required to be open. Turn off all electrical equipment when not in use.

Table A-2. Nuclear defense level B.

NUCLEAR DEFENSE LEVELS LEVEL B - LIKELY	
OFFENSE	DEFENSE
PERSONNEL	
Inform personnel.	Inform personnel.
Restrict movement away from fighting position or vehicle except for mission-essential tasks.	Complete fighting positions with at least 18 inches of dirt overhead cover.
	Initiate periodic monitoring with radiacmeter.
	Remain near fighting positions or vehicles.
RADIOS	
Use one radio per scout squad; turn off other radios.	Use no more than two radios per platoon.
	Use wire or messenger whenever possible.
Remove unused antennas, disconnect lead-ins, and stow in vehicle.	Remove unused antennas, disconnect lead-ins, and stow in vehicle.
EQUIPMENT	
Secure all loose equipment.	Secure equipment by tying it down or placing it inside vehicle or fighting position.
Move in defilade and avoid forests or urban areas if possible.	Move in defilade.
Close and latch all hatches not required to be open.	Close and latch all hatches not required to be open.

Table A-3. Nuclear defense level C.

NUCLEAR DEFENSE LEVELS LEVEL C - IMMINENT	
OFFENSE	DEFENSE
PERSONNEL	
Inform personnel.	Inform personnel.
Prepare to cover face with cloth or handkerchief (do not use protective mask).	Prepare to cover face with cloth or handkerchief (do not use protective mask).
Place all personnel in armored vehicles.	Have all personnel in fighting positions or vehicles.
RADIOS	
Use visual signals to control movement.	Turn off all radios.
Use one vehicle radio per squad.	Use wire communications.
	Remove unused antennas, disconnect lead-ins, and stow in vehicle.
EQUIPMENT	
Secure all loose equipment.	Secure equipment by tying it down or placing it inside vehicle or fighting position.
Move in defilade.	Move to a defilade position, avoiding forests or urban areas if possible.
Close and latch all hatches not required to be open.	Close and latch all hatches.
	Traverse turrets to rear and lock.
Turn off all electrical equipment when not in use.	Turn off all electrical equipment.

BIOLOGICAL DEFENSE

The key protective measure against a biological attack is maintaining a high order of health, personal hygiene, and sanitation discipline. Biological attacks are hard to detect. If an attack occurs, the chances of survival are better if crewmembers are healthy and physically fit and maintain good personal hygiene. Keeping the body clean helps to prevent ingestion of chemical agents. Keep small cuts or scratches covered and germ-free by using soap, water, and first-aid measures. Since insects carry biological agents, prevent insect bites by keeping clothes buttoned and covering the skin.

Do not eat food or drink water that maybe contaminated. After an attack, you must assume that all surfaces have been exposed to germs. Eat or drink only food that has remained sealed; consume it only after you have washed and cleaned the outside of the container. All water must be boiled at least 15 minutes.

DEFENSE BEFORE A CHEMICAL ATTACK

Make sure all personnel have their protective masks available, and make sure each mask fits and functions properly. All personnel should wear the proper protective clothing in accordance with the MOPP level designated by the commander.

Inform everyone to remain alert and constantly aware of the chemical threat. Protect all equipment and supplies from liquid chemical contamination by keeping them organized and covered.

Activate the automatic alarm system. It will be the primary means of detecting an upwind chemical attack. The system provides two essential elements of survival: detection of a toxic agent cloud and early warning to troops in the monitored position.

The platoon leader decides where to place the chemical alarm. In stationary operations, he first determines the wind direction, then places available detector units upwind of the nearest position to be protected. The detector unit should be no more than 400 meters upwind from the alarm unit. The optimum distance is 150 meters. Operation of the alarm can be affected by blowing sand or dust, rain, sleet, snow, temperatures below 40 degrees Fahrenheit (4.5 degrees Celsius), and tropical conditions.

Space the available detector units approximately 300 meters apart, and make sure each detector unit is connected to each alarm unit by telephone cable (WD-1). Position the alarm units near radiotelephone communications; this makes it easy to alert the unit of an attack.

Section II. PROTECTION

If the NBC hazard cannot be avoided, the scout platoon must be prepared to protect personnel and equipment from the effects of exposure. The type and degree of protection required will be based on the unit's mission and the hazard. Note that the line between avoidance and protection is not distinct. Many actions contribute equally to contamination avoidance and protection.

Soldiers on the integrated battlefield will face a combination of nuclear, chemical, and conventional attacks. The key to effective protection in an NBC environment is the scout platoon's proficiency in automatically and correctly implementing an effective NBC defense SOP. Individual and unit protection against chemical attack or contamination hinges on effective use of the MOPP and on individual proficiency in basic NBC skills. The five levels of MOPP, illustrated in [Figure A-1](#), page A-8, should be listed in the SOP.

DEFENSE DURING A NUCLEAR ATTACK

Dismounted Defensive Actions

Never run for cover! Immediately drop flat on the ground (face down) or to the bottom of a foxhole, facing away from the fireball. Cover exposed skin as much as possible. Close your eyes. Remain down until the blast wave has passed and debris has stopped falling. Stay calm, check for injury, check weapons and equipment for damage, and prepare to continue the mission.

Mounted Defensive Actions

If time permits, take the following actions:

- Position your vehicle behind the best available cover with the front of the vehicle toward the blast.
- Point the gun away from the blast.

- Lock the brakes.
- Secure loose equipment inside the vehicle to prevent injuries and equipment damage.
- Secure all exterior components that could be damaged by the blast (such as water cans, duffel bags, and antennas) inside the vehicle.
- Close and lock all hatches, including ballistic shields.
- Wear your helmet and protect your eyes.

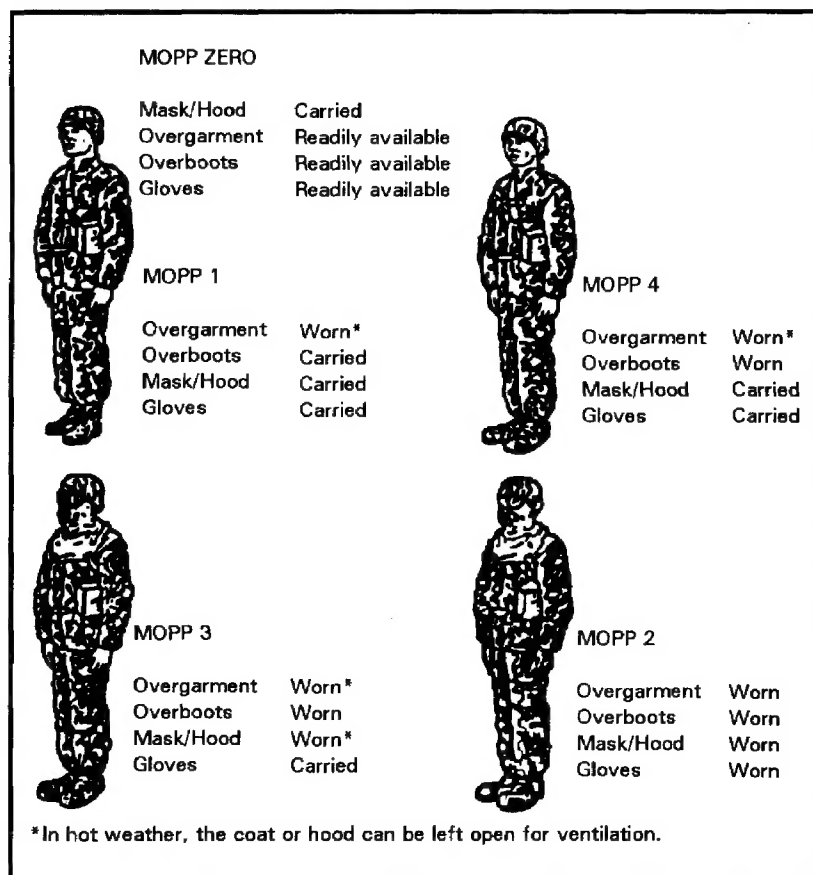


Figure A-1. MOPP levels.

DEFENSE AFTER A NUCLEAR ATTACK

Once the attack has ended, forward an NBC-1 nuclear report, organize the survivors, secure and organize equipment, repair and reinforce the BP, assist casualties, improve protection against possible fallout, and begin continuous monitoring. If the radiation dose rate reaches a hazardous level after fallout is complete, be prepared to move, on order, to a less hazardous area.

Fallout Warning

The first person to detect the arrival of fallout is usually the radiological monitor operating a radiacmeter. As soon as he notes a dose rate of 1 centigray per hour (cGy/hr or rad per hour) or higher, he warns unit personnel. All personnel hearing the warning relay it to others. If the mission allows, soldiers should get in a shelter with overhead cover and stay there until given an "ALL CLEAR" signal or until otherwise directed to move. If the mission does not allow the unit to take cover, decontamination becomes more important and perhaps more difficult.

Supervision of Radiological Monitoring

Designate a point in your area where readings will be taken, and note the grid coordinates of that point. Check the operator to make sure he takes readings at least once each hour from this point, zeroes the radiacmeter before taking each reading, and uses the radiacmeter properly. Make sure the operator immediately reports all readings showing the presence of radiation, as well as the time of these readings. Use this information and the location of the readings to prepare an NBC-4 report. Have the operator monitor continuously if any of the following conditions occur:

- A reading of 1 cGy/hr or more is obtained.
- A fallout warning is received.
- A nuclear burst is seen, heard, or reported.
- An order to monitor is received.
- The unit begins to move.

Continue these operations until directed to stop or less than 1 cGy/hr is detected.

Supervision of Tactical Dosimetry Operations

A scout platoon will normally be issued two dosimeters. Select two soldiers, one from the vehicle of each team leader, to wear them. Check all dosimeters to be used for the operation; any that do not read zero should be turned in for recharging. If a charger is not available, note the original reading. Make sure dosimeter readings are reported accurately. Collect readings at least once daily. Average these readings, round to the nearest 10, and report this average to higher headquarters.

For operating in or crossing radiologically contaminated areas, follow the individual actions for nuclear defense level C (see [Table A-3](#) page A-5). Vehicles should be closed tightly; cargoes should be covered by tarps or tenting. Mission permitting, speed should be kept down to prevent dust, and vehicles should maintain adequate distance to stay out of the dust raised by preceding vehicles. After the unit exits a contaminated area, personnel, equipment, and cargo should be checked for contamination and decontaminated, if necessary. Dose rates should be monitored closely to ensure compliance with operational exposure guidance (OEG). Radiation exposure status should be updated, if appropriate.

DEFENSE DURING A CHEMICAL ATTACK

Give the alarm. Have all unmasked soldiers put on their protective masks and other MOPP gear. Use chemical agent detector kits (M256) to determine the type of agent, and forward an NBC-1 chemical report. Continue the mission.

DEFENSE AFTER A CHEMICAL ATTACK

Forward an NBC-1 chemical report, treat casualties, perform emergency decontamination as required, and mark the contaminated area.

PASSING ALARMS AND SIGNALS

When an NBC attack is recognized, everyone must receive the warning and assume appropriate MOPP level (see [Figure A-1](#) page A-8). Soldiers in immediate danger need warnings they can see or hear. The alarm or signal must be simple and unmistakable for quick and correct reaction. Units not immediately affected need the information to prepare for the hazard or to change plans. When an NBC hazard has been located, the contaminated area should be marked. The

NBC warning and reporting system (NBCWRS) and contamination markers contribute to orderly warning procedures.

Vocal Alarms

To give a vocal alarm for any chemical or biological hazard or attack, the person detecting the hazard stops breathing, masks, and shouts “GAS!” as loudly as possible. Everyone hearing this alarm must immediately mask, repeat the alarm, and take cover from agent contamination and fragmentation of munitions. It may also be necessary to pass the alarm over the radio or telephone. Visual signals must supplement vocal alarms.

Automatic Alarms

If an M8 automatic chemical agent alarm sounds or flashes, the first person to hear or see it stops breathing, masks, and yells “GAS!” This alarm is relayed throughout the unit by voice, signal, and if required, radio.

Nonvocal Signals

Since one person yelling “GAS!” may not be heard over the sounds of combat, sound signals by means other than voice may be required to warn unit personnel. These signals must produce noise louder than, and not easily confused with, other sounds of combat. The NBC hazard warning alarm will be specified in the unit SOP. Following are some suggestions:

- Rapid and continuous beating together of any two metal objects to produce a loud noise. Sample SOP entry: “The audible warning of a chemical attack is rapid and continuous beating of metal on metal.”
- A succession of short blasts on a vehicle horn or other suitable device. Sample SOP entry: “While in convoy, five short blasts on a vehicle horn is the audible signal for a chemical attack.”
- An intermittent warbling siren sound. Sample SOP entry: “The audible alarm for impending chemical attack is the sounding of the installation siren as follows: 10 seconds on, 5 seconds off; sequence repeated for 2 minutes.”

Visual Signals

Visual signals may replace sound alarms when the sound may be lost amid battlefield noises or when the situation does not permit the use of sound signals. The standard hand-and-arm signal for an NBC hazard is illustrated in Figure A-2. Signaling is done by extending both arms horizontally to the sides with fists closed and facing up, then rapidly moving the fists to the head and back to the horizontal position. This is repeated until other elements react. Colored smoke or flares may also be designated as visual signals for an NBC hazard but must be specified in unit SOPs.

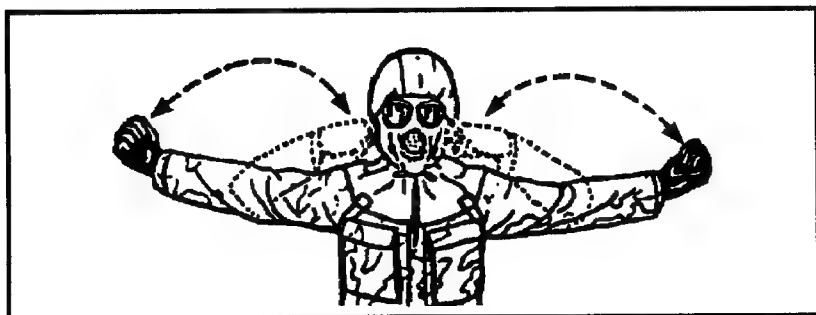


Figure A-2. Hand-and-arm signal for NBC hazard.

SYMPTOMS AND TREATMENT OF NBC CASUALTIES

Soldiers must be able to recognize symptoms and conduct self-aid and buddy-aid. The basic steps in first aid apply in any combat environment.

Nuclear Casualties

Blast injuries. Blast injuries can range from minor cuts and broken bones to severe lacerations and critical damage to vital organs. The first-aid treatment will be the same as that used for conventional combat casualties suffering similar injuries.

Thermal radiation injuries. The intense heat generated by a nuclear detonation can cause burn injuries. First-degree burns should heal without special treatment, and there will be no scar formation. Second-degree burns resemble a severe sunburn with blistering; they should be treated as a burn to prevent infection. In third-degree burns, the full thickness of the skin is destroyed; the victim should be treated as a burn casualty and evacuated.

Biological Casualties

It is necessary to isolate soldiers showing symptoms of disease to prevent spreading infection to others. Casualties resulting from live biological agents or toxins require medical treatment as soon as possible. One indication of a live biological agent attack is large numbers of soldiers developing an unexplained illness over a short period of time. A wide variety of toxins is available to potential adversaries for use on the modern battlefield. These can be dispensed alone or with other carriers or agents. Symptoms associated with some toxins mimic those of other types of illness or chemical casualty symptoms. Toxin symptoms may include any of the following:

- Dizziness, mental confusion, or double or blurred vision.
- Formation of rashes or blisters.
- Coughing.
- Fever, aching muscles, and fatigue.
- Difficulty in swallowing.
- Nausea, vomiting, and/or diarrhea.
- Bleeding from body openings or blood in urine, stool, or sputum (spit).
- Shock.

These symptoms may appear within minutes after the toxin attack, or they may be delayed several hours. Appropriate self-aid and buddy-aid vary, depending on the agent. Soldiers should first mask to prevent inhaling or ingesting agents. Then they should remove agents from exposed skin, either by washing with soap and water or by using the M258A1 kit. Buddy-aid consists of soldiers helping each other clean exposed skin, observing each other for early symptoms of toxic exposure, and requesting medical assistance.

Chemical Agent Casualties

A chemical casualty presents a special situation. The first important step is to recognize symptoms so proper treatment can be administered. Chemical agents can kill or incapacitate. Their primary routes of attack upon the body are

through the respiratory system and the skin. These agents fall into four major categories: nerve, blister, blood, and choking agents.

Nerve agents. Nerve agent poisoning can lead to a quick death; recognizing its symptoms is crucial. Immediate self-aid or buddy-aid is needed if most or all symptoms appear. Early symptoms usually appear in the following progression:

- Runny nose.
- Red, tearing eyes.
- Sudden headache.
- Excessive flow of saliva (drooling).
- Tightness in the chest, leading to breathing difficulty.
- Impaired vision.
- Muscular twitching in the area of exposed or contaminated skin.
- Stomach cramps.
- Nausea.

Severe nerve agent poisoning is likely when any of the early symptoms are accompanied by all or most of the following symptoms:

- Strange or confused behavior.
- Gurgling sounds when breathing.
- Severely pinpointed pupils.
- Loss of bladder and/or bowel control.
- Vomiting.
- Convulsions.
- Absence of breathing.

No effective drug exists to remedy the effects of nerve agents on vision. If soldiers experience any of the other mild symptoms of nerve agent poisoning, they must perform the following self-aid measures:

- Step 1. Put on your protective mask.
- Step 2. Remove a Mark I nerve agent autoinjector kit (NAAK) from your protective mask carrier (see [Figure A-3](#), page A-16).
- Step 3. Inject one thigh with the first injector from your kit (atropine in the small autoinjector). Hold the injector against your thigh for at least 10 seconds. Remove the injector.
- Step 4. Immediately inject your thigh with the second injector (pralidoxime chloride in the large injector). Hold the injector against your thigh for at least 10 seconds.
- Step 5. Remove the injector and place each injector needle through the jacket pocket flap of your overgarment, bending each needle to form a hook.
- Step 6. Massage the injection area, if time permits and your suit is not contaminated.
- Step 7. If symptoms persist or recur, wait 10 to 15 minutes and repeat both injections. Repeat again if needed. Allow 10 to 15 minutes between each set of injections. Do not administer more than three NAAK sets. Medical support personnel must authorize the administration of more than three sets.

If a soldier experiences severe symptoms from nerve agent poisoning and is unable to administer self-aid, another soldier must perform the following buddy-aid measures:

- Step 1. Mask the casualty.
- Step 2. Using the victim's NAAK, administer three sets immediately and in rapid succession in the thigh muscle of either leg. Do not wait between injections.

Step 3. Administer the back-pressure armlift method of artificial respiration if the casualty's breathing is labored or has ceased.

Step 4. Hook the expended autoinjectors to the casualty's overgarment jacket pocket flap.

Step 5. Obtain medical attention for the victim as soon as possible.

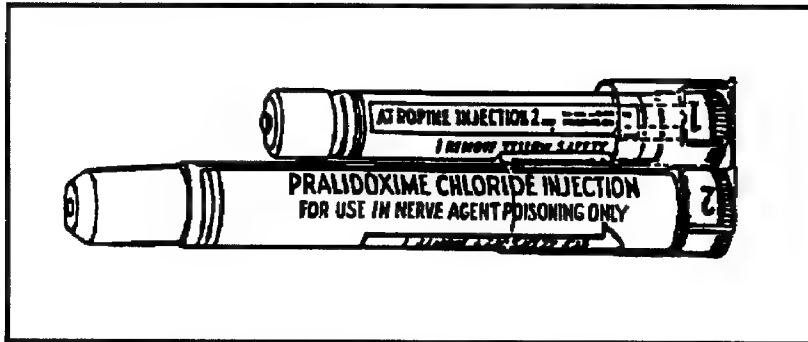


Figure A-3. Mark I nerve agent autoinjector kit.

WARNING:

If your heart beats very rapidly and your mouth becomes very dry within 5 minutes after the administration of the first NAAK, *do not* give yourself another set of injections. This may indicate a serious reaction. Seek medical treatment as soon as possible.

Blister agents. Casualties resulting from blister agents may not be noticeable immediately. Symptoms may take several hours or days to appear. They include the following:

- Redness or inflammation of the eyes,
- Temporary blindness or, with severe poisoning, permanent blindness.

- Itching, burning, or reddening of the skin.
- Welts or, in an advanced state, blisters on the skin.
- Hoarseness.
- Coughing.
- Difficult or labored breathing.
- Stomach pain.
- Nausea.
- Vomiting
- Diarrhea.

If blister agents come in contact with skin or eyes, remove the agents immediately. To remove agent from the eyes, flush repeatedly with plain water. Decontaminate the skin using the M258A1 kit. If severe blisters form, seek medical attention as soon as possible.

Blood agents. A seemingly mild case of blood agent poisoning can progress to death within 10 minutes. Symptoms include the following:

- Rapid or shallow respiration (panting).
- Headache.
- Dizziness or giddiness.
- Red or pink color change in light-colored skin.
- Convulsions.
- Coma.

There is no self-aid or buddy-aid treatment for blood agent poisoning. Victims should seek medical attention.

Choking agents. These agents produce casualties through inhaled vapors. They damage blood vessels in the lung walls, causing body fluid to slowly fill

the lung cavity. Ordinary field concentrations do not cause death, but prolonged exposure to high concentrations of the vapor and neglect or delay in masking can be fatal. Maximum damage will occur between 12 and 24 hours after exposure. In most cases, the excess fluid in the lungs will absorb back into the body. Slow recovery will begin approximately 48 hours after exposure.

During and immediately after exposure, symptoms may include the following:

- Coughing.
- Choking.
- Tightness in the chest.
- Nausea.
- Headache.
- Tearing of the eyes.

Following the early symptoms, a symptom-free period of 2 to 24 hours is likely. This period will be followed by signs of fluid collecting in the lungs, including—

- Rapid, shallow breathing.
- Painful coughing.
- Blue lips and fingernails.
- In severe cases, clammy skin and rapid heartbeat.

No self-aid or buddy-aid treatment exists for choking agent symptoms. If only minimum amounts were inhaled, the soldier may continue normal duties. If definite symptoms occur, the soldier should keep warm and seek immediate medical attention and rapid evacuation to an aid station.

MARKING CONTAMINATION

Contamination must be marked so unsuspecting personnel will not be exposed to it. Markers are shown in [Figure A-4](#). When platoon detection,

monitoring, or reconnaissance teams detector suspect NBC hazards, they mark all likely entry points into the area and report the contamination to higher headquarters. The only exception to this policy is if marking the area would help the enemy. If this exception is made by the commander, the hazard must still be reported to protect friendly units.

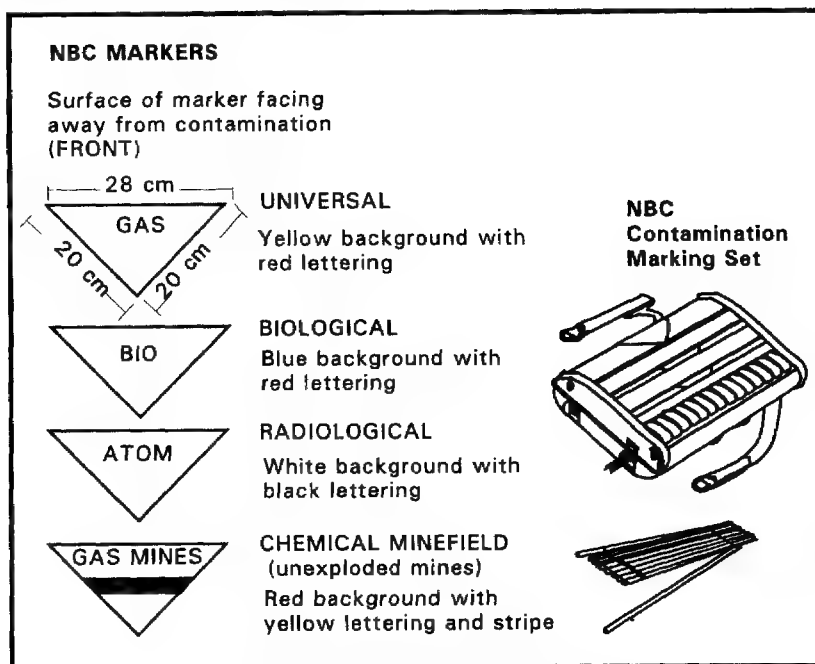


Figure A-4. NBC marking devices.

Marking Procedures

Markers face away from the contamination. For example, if markers are placed on the edge of a contaminated area to mark a radiological hot spot, they face away from the point of the highest contamination reading. Markers are placed at roads, trails, and other likely points of entry. When time and mission permit, additional markers should be emplaced. The distance between signs varies. In open terrain, they can be placed further apart than in hilly or wooded areas. You should be able to stand in front of a marker and see the markers to the left and right of it.

Units discovering a marked contaminated area do not have to conduct elaborate, time-consuming surveys. The new unit checks the extent of contamination and alters its plans, if necessary. If the size of the hazard is reduced, they relocate the signs. If the hazard is gone, they remove the signs. Changes are reported to higher headquarters.

Types of Markers

US forces use NATO standard markers to make it easier for allies to recognize the hazards. These markers are in the standard NBC marking set. The colors and inscriptions on a marker indicate the type of hazard (see [Figure A-4](#), page A-19). Any additional information is written on the front of the sign.

UNMASKING PROCEDURES

Soldiers should unmask as soon as possible except when a live biological or toxin attack is expected. The following procedures determine if unmasking is safe.

With M256/M256A1 Kit

If an M256/M256A1 detector kit is available, use it to supplement the unmasking procedures. The kit does not detect all agents; therefore, proper unmasking procedures must also be used. These procedures take approximately 15 minutes. If all tests with the kit (including a check for liquid contamination) have been performed and the results are negative, the senior person should select one or two soldiers to start the unmasking procedures. If possible, they move to a shady place. Bright, direct sunlight can cause pupils in the eyes to constrict, giving a false symptom. The selected soldiers unmask for 5 minutes, reseal, and clear their masks. Observe them for 10 minutes. If no symptoms appear, it is safe to give the all-clear signal and unmask. Continue to watch the soldiers for possible delayed symptoms. Always have first-aid treatment immediately available in case it is needed.

Without M256/M256A1 Kit

If an M256/M256A1 kit is not available, the unmasking procedures take approximately 35 minutes. Find a shady area. Use M8 paper to check the area for possible liquid contamination. When a reasonable amount of time has passed after the attack, the senior person should select one or two soldiers. They take a

deep breath and break the mask seals, keeping their eyes wide open, for about 15 seconds. They then clear and reseal their masks. Observe them for 10 minutes. If no symptoms develop, they again break the seals and take two or three breaths; they then clear and reseal their masks. Again observe them for 10 minutes. If no symptoms appear, the selected soldiers unmask for 5 minutes and then remask. If no symptoms appear in 10 minutes after remasking, everyone can unmask. Continue to observe the selected soldiers in case delayed symptoms develop.

ALL-CLEAR SIGNAL

The all-clear signal is given by word of mouth through the chain of command. This signal is given by leaders after testing for contamination proves negative. If required, standard sound signals maybe used, such as a continuous, sustained blast on a siren, vehicle horn, or similar device. When “ALL CLEAR” is announced on the radio, it must be authenticated before compliance. The commander designates the specific all-clear signal and includes it in his SOP.

OPERATING WARNING AND REPORTING SYSTEMS

The NBCWRS is a rapid means of sending reports of an NBC attack. These reports inform other affected units of clean areas and possible contamination. They also report contaminated areas up and down the chain of command and to adjacent units. Each report has a specific purpose and uses standard codes to shorten and simplify the reporting process. The formats and letter codes for the standard NBC reports are found in FKSM 17-98-3.

Section III. DECONTAMINATION

Since continued operation in the presence of nuclear or chemical contamination will cause casualties and severe combat degradation, decontamination is essential. To get the maximum benefit of the time and decontamination resources available, the scout platoon should decontaminate—

- As soon as possible.
- Only to the extent necessary to ensure safety and operational readiness.
- As far forward as possible.
- By priority.

These principles are consistent with doctrine that places the burden of decontamination at battalion or troop level. For this reason, the scout platoon must use all available decontamination assets to their maximum benefit and develop a thorough SOP covering decontamination methods and priorities.

Refer to FM 3-5 for more detailed information on NBC decontamination.

BASIC SOLDIER SKILLS

Skin decontamination is a basic soldier survival skill. Any contact between chemical or toxic agents and bare skin should be treated as an emergency. Some agents can kill if they remain on the skin for longer than a minute. The best technique for removing or neutralizing these agents is to use the M258A1 skin decontamination kit. Leaders must ensure soldiers are trained to execute this technique automatically, without waiting for orders.

Personal wipedown should begin within 15 minutes of contamination. The wipedown removes or neutralizes contamination on the hood, mask, gloves, and personal weapon. For chemical and biological contamination, soldiers use packets from the M280 decontamination kit. For radiological contamination, soldiers wipe the contamination off with a cloth or simply flush or shake it away.

Operator's spraydown should begin immediately after completion of personal wipedown. The spraydown removes or neutralizes contamination on the surfaces operators must frequently touch to do their mission. For chemical and biological contamination, operators use on-board decontamination apparatuses like the M11. For radiological contamination, they brush or scrape the contamination away with whatever is at hand or flush with water and wipe.

HASTY DECONTAMINATION

Hasty decontamination allows a force to continue fighting and sustain its mission after being contaminated. It limits the hazard of transferring contamination by removing most of the gross contamination on equipment and nearly all the contamination on soldiers. This speeds the weathering process and allows clean areas (people, equipment, and terrain) to stay clean. Following hasty decontamination, soldiers who have removed sources of vapor contamination from their clothing and equipment can use hazard-free areas to unmask temporarily to eat, drink, and rest.

Hasty decontamination is accomplished using assets of the parent unit. It makes use of two decontamination techniques: vehicle washdown and MOPP gear exchange. These procedures can be performed separately from each other; both are best performed at squad level. Vehicles and personnel that are not contaminated should not go through either technique.

Vehicle washdown is conducted as far forward as possible and is performed by the battalion decontamination specialist with assistance from the squad decontamination crew. It is most effective if started within 1 hour after contamination. There are two steps in vehicle washdown:

Step 1. Button up the vehicle and secure equipment.

Step 2. Wash down the vehicle and equipment with hot, soapy water for 2 to 3 minutes.

Because speed is important, do not check vehicles for contamination after vehicle washdown. Remove only gross contamination.

MOPP gear exchange is best performed using the buddy system. The company assists the platoon by bringing replacement overgarments and decontaminants to the exchange site. There are eight steps in a MOPP gear exchange:

Step 1. Decontaminate and drop gear.

Step 2. Decontaminate hood and gloves, and roll up hood.

Step 3. Remove overgarment.

Step 4. Remove overboots and gloves.

Step 5. Put on new overgarment.

Step 6. Put on new overboots and gloves.

Step 7. Secure hood.

Step 8. Secure gear.

Step 1 is performed by both soldiers. Steps 2 through 7 are performed first by one soldier, then by the other. Step 8 is performed by both soldiers.

DELIBERATE DECONTAMINATION

Deliberate decontamination operations reduce contamination to negligible risk levels. They restore combat power by removing nearly all contamination from unit and individual equipment. This allows troops to operate equipment safely for extended periods at reduced MOPP levels. A contaminated unit conducts detailed troop decontamination under supervision of the chemical unit. Ordinarily, the chemical unit selects a site, sets it up, and performs the detailed equipment decontamination with assistance from the contaminated unit. A small risk from residual contamination remains, so periodic contamination checks must be made after this operation.

Deliberate decontamination is conducted as part of an extensive reconstitution effort in brigade, division, and corps support areas; support sites at lower levels cannot provide the quantities of decontamination resources (such as water, decontaminants, and time) required for such an extensive process. In some cases, a contaminated unit could conduct a deliberate decontamination operation with organic decontamination assets, but support from a chemical unit is usually required. After deliberate decontamination, the unit moves into an adjacent assembly area for reconstitution. Support elements from the brigade, division, or corps support areas replenish combat stocks, refit equipment, and replace personnel and equipment. The newly reconstituted unit leaves the assembly area fully operational and fit to return to battle.

Deliberate decontamination does the most thorough job of getting rid of contamination and its hazards, but it often is not possible. It requires large quantities of valuable resources that may not be immediately available. The next best solution is to decontaminate only what is necessary to sustain the force and continue to fight.

Section IV. THE NBC RECONNAISSANCE PLATOON

ORGANIZATION

NBC Reconnaissance Vehicles

M93 Fox. The M93 NBC reconnaissance system (NBCRS) is a six-wheeled, light-armored vehicle specifically designed to perform NBC reconnaissance and

operate in a contaminated environment. The vehicle allows crewmembers to conduct soil and air sampling, as well as area marking, without dismounting. Its overpressure air purification system permits the crew to conduct NBC reconnaissance in a contaminated environment while maintaining a degraded MOPP level (see Figure A-5).

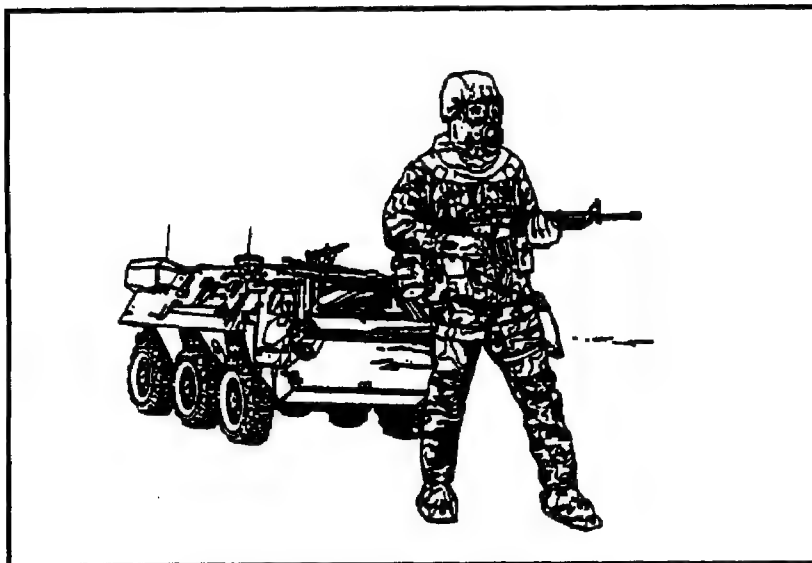


Figure A-5. M93 NBC reconnaissance system.

HMMWV and M113A2. These vehicles are identical to those found in the scout platoon. They are armed with the caliber .50 machine gun.

Heavy Division NBC Reconnaissance Platoon

The heavy division NBC reconnaissance platoon consists of an officer and 19 enlisted soldiers. It is organized with a platoon headquarters and three reconnaissance squads (see [Figure A-6](#), page A-26). The platoon is equipped with six vehicles, either M93 NBGRS or M113A2 APCs.

The platoon headquarters provides command and control for the platoon. It consists of the platoon leader and the PSG; during operations, they ride in two of the squad vehicles. Each squad is composed of a squad leader, an assistant squad leader, and the crews manning two M93s or M113A2s.

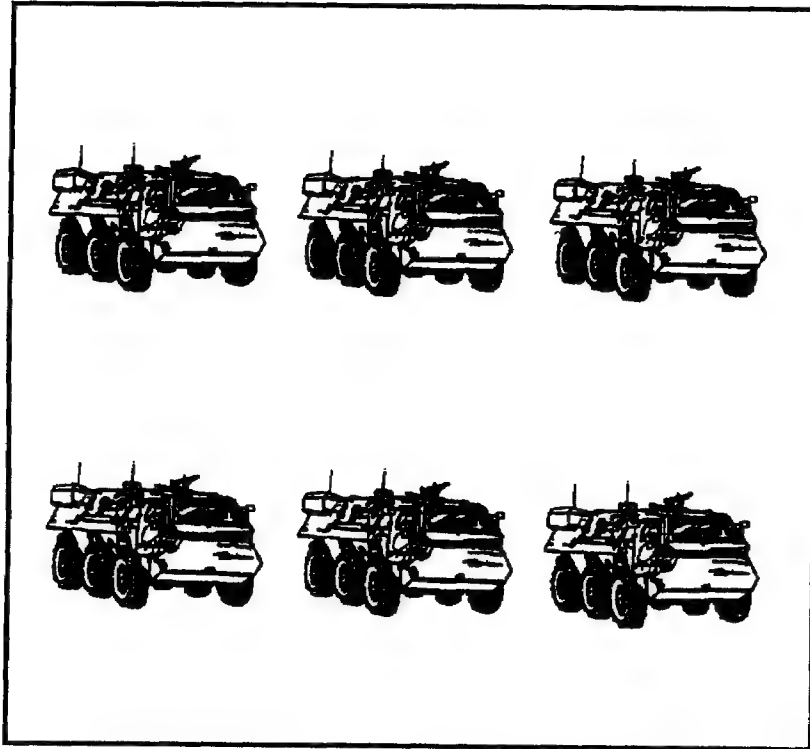


Figure A-6. Heavy division NBC reconnaissance platoon.

Armored Cavalry Regiment NBC Reconnaissance Platoon

Each chemical company assigned to an ACR has an organic NBC reconnaissance platoon. This platoon is equipped with M93s and is organized identically to the heavy division platoon.

Light Cavalry Regiment NBC Reconnaissance Platoon

The light cavalry regiment's chemical company contains two NBC reconnaissance platoons, each consisting of one officer and 13 enlisted men. The platoons are similar in organization to the heavy division and ACR platoon, but with only two squads each (see [Figure A-7](#)). They are equipped with four M93s.

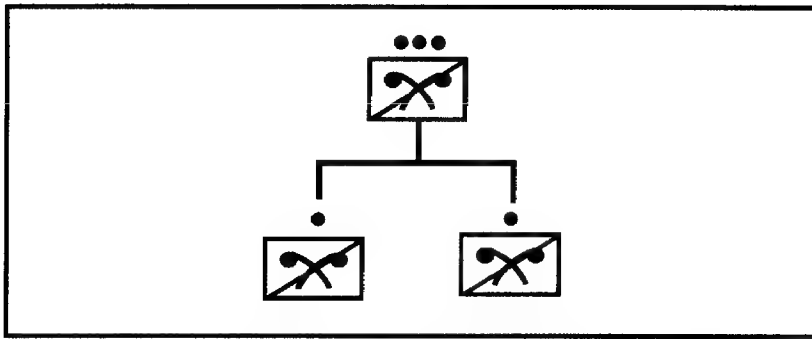


Figure A-7. Light cavalry regiment NBC reconnaissance platoon.

NBC Reconnaissance Company

There are two types of NBC reconnaissance companies. One is equipped with the M93, the other with the HMMWV. The authorized personnel strengths of the two types differ slightly, but both contain 24 dedicated NBC reconnaissance vehicles.

The NBC reconnaissance company operates in the corps or division area to provide reconnaissance support for elements of a corps or theater army. Each corps is allocated one of these companies. Normally, the company is deployed as a separate company in the corps under control of the chemical brigade; however, the company may be attached to a corps chemical battalion.

Each NBC reconnaissance company consists of a headquarters and three platoons (see Figure A-8). Each platoon consists of an officer and 25 enlisted men, organized into four squads of two vehicles each.

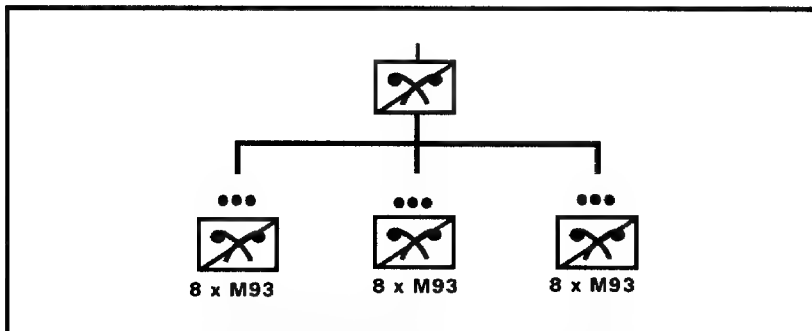


Figure A-8. Chemical company (reconnaissance).

CAPABILITIES

The capabilities of an NBC reconnaissance platoon equipped with HMMWVs or M113A2s are not significantly different from those of the scout platoon. Platoons equipped with the M93, however, have several unique capabilities, including the following:

- They can conduct NBC reconnaissance and survey operations on the move without halting or dismounting to take samples.
- The M93 has a built-in vehicle navigation system.
- M93-equipped platoons can detect and identify all known chemical agents.
- The vehicle's overpressure system allows the crew to operate in degraded MOPP.
- The M93 swims easily with little preparation.
- The M93's air conditioner allows operation of detection equipment in extreme conditions.
- Contaminated areas can be marked without dismounting.
- Unknown contamination agent data can be stored for future analysis.

LIMITATIONS

The M93 NBCRS is a very capable vehicle, but the following limitations must be considered in its employment:

- The M93 can easily be mistaken for an enemy vehicle.
- It requires specialized maintenance support.
- It is lightly armed and armored.
- The crew must spend 15 to 20 minutes to initially prepare on-board chemical detection equipment for operation.
- Because it is not tracked, the vehicle is restricted in some terrain.

RELATIONSHIP WITH THE SCOUT PLATOON

The NBC reconnaissance platoon, particularly in the division and cavalry regiment, often works closely with either battalion or cavalry scout platoons. When the two organizations are working together, their capabilities should be used to complement each other. The command relationship between the platoons should be based on METT-T factors, but it can be one of the following:

- The scout platoon OPCON to the NBC reconnaissance platoon.
- The NBC reconnaissance platoon OPCON to the scout platoon.
- The two platoons working together under the control of a common commander.

As an example, if the primary focus of the platoons' reconnaissance mission is to locate contaminated areas, the NBC reconnaissance platoon leader maybe selected to lead the operation. On the other hand, the scout platoon leader may be selected to lead and coordinate the mission if enemy presence is significant, if extensive dismounted operations are anticipated, or if the mission is enemy force-oriented.

In all cases when the two types of platoons are operating together, the NBC platoon's primary task should be NBC reconnaissance. The scout platoon has capabilities for which it is better equipped or organized; it should perform tasks related to those capabilities, such as the following:

- Overwatch and security for NBC reconnaissance elements.
- Dismounted operations in conjunction with NBC reconnaissance.
- Reconnaissance of bypasses once a contaminated area is identified.
- Initial location of contaminated areas, followed by handoff to the NBC reconnaissance platoon for detailed reconnaissance and marking.
- Liaison or command and control linkup between the NBC reconnaissance platoon and the commander of the scouts.

Section V. RECONNAISSANCE AND SECURITY IN AN NBC ENVIRONMENT

In an ideal situation, all NBC reconnaissance will be performed by an NBC reconnaissance platoon. Given the very limited number of these platoons available and the likelihood of chemicals being used on the battlefield, the scout platoon not only must be able to perform its own missions in a contaminated environment, but also must have the capability of conducting NBC reconnaissance.

RECONNAISSANCE

Crossing a Contaminated Area

As with other combat elements, one of the basic requirements for the scout platoon is to be able to move tactically across a contaminated area. Upon identifying a contaminated area, each scout team makes preparations to cross. While one vehicle provides security, the other vehicle, positioned in a covered and concealed location, removes all externally stowed equipment. The crew mounts and tests M8A1 alarms and M9 paper. The crew adopts MOPP level 4. Once preparations are complete, the vehicle moves into an overwatch position; the other vehicle moves to a covered and concealed position and follows the same procedures.

When both vehicles have been prepared, they use standard tactical movement techniques (such as bounding overwatch) to cross the contaminated area. During this movement, the driver's and gunner's hatches remain closed, and the crew continuously monitors the M8A1 and the M9 paper. Drivers and vehicle commanders attempt to avoid low ground, overhanging branches, and brushy areas as much as possible. Dismounted operations are still conducted, but they are kept to the absolute minimum necessary to perform the mission while maintaining security. While the team is in the contaminated area, all personnel observe each other for signs of chemical poisoning.

Once the team has successfully crossed the contaminated area, it temporarily halts. During this halt, each squad in turn executes hasty decontamination of its vehicle and, with higher headquarters' approval, unmasking procedures. Once this is complete, the team continues its mission.

Detecting and Marking a Contaminated Area

US doctrine requires that combat missions be accomplished quickly and effectively, under all conditions and at any time. One of the reasons an enemy would use persistent and nonpersistent chemicals is to cause confusion and thus slow down the tempo of friendly operations. The effectiveness of these agents can be reduced if the friendly commander knows the exact location of contaminated areas. Within a division or regiment, specialized NBC reconnaissance platoons can accomplish this; however, as noted, very few of these platoons exist. All scout platoons must therefore understand how to systematically locate and designate suspected contaminated areas.

When assigned a mission or task to locate and mark a suspected contaminated area, the scout platoon must ensure that it prepares properly for the mission. Preparation for an NBC reconnaissance mission begins with inspection of personnel and team equipment. As a minimum, each squad must have on hand the equipment listed in Figure A-9.

EQUIPMENT	INDIVIDUAL	VEHICLE
M8 paper	X	
M9 paper	X	
M256 kit		X
M8A1 alarm		X
CAM		X
Marking kit		X
M13 DAP		X
M258A1	X	
MOPP	X	
Mark I NAAK	X (3)	
VS 17 panel		X

Figure A-9. NBC reconnaissance equipment list.

In addition to ensuring that the proper equipment is on hand, leaders must ensure that alarms and paper are properly mounted and functioning and that all external equipment is stowed. The platoon leader includes a rehearsal of NBC reconnaissance techniques in his mission preparation. The platoon leader will also coordinate with the unit chemical officer for any special instructions,

ensuring that deliberate decontamination support is available at the conclusion of the mission.

Once mission preparation is complete, the platoon moves to the suspected contaminated area (designated as a reconnaissance objective) using movement techniques and organization appropriate to the tactical situation. As the platoon approaches the suspected objective area, it stops short and reorganizes, assuming a three-team organization in the cavalry scout platoon and a four-team organization in the battalion scout platoon. The teams are deployed on line, with no more than 400 meters between vehicles and no more than 400 meters between teams. All elements go to MOPP 4. The platoon leader directs the platoon to close hatches and begin movement in the direction of the contaminated area.

The platoon moves by bounding overwatch within teams. Lead vehicles bound no more than 200 meters. As they move forward, they move slowly to avoid stirring up dust and running over or under foliage. The lead elements move to the limit of their bound, halt, and sample the soil and air for contamination. Air sampling is conducted automatically by the functioning M8A1 alarm. Ground sampling is done without dismounting, using M8 paper mounted on a stick or using the chemical agent monitor (CAM). The team leaders report their results to the platoon leader; they do not proceed further without permission. The platoon leader strictly controls the movement of the teams. If all teams report negative samples, the platoon leader gives permission for the overwatch vehicles to move up. As long as the results remain negative, the platoon continues to move in this manner through the suspected contaminated area and up to 3 kilometers beyond it. The platoon leader reports the negative results of the reconnaissance to his higher headquarters (see [Figure A-10](#)).

If a squad makes positive contact with contamination, it immediately reports to the platoon leader. As the platoon leader sends his initial report to higher headquarters, the squad leader rechecks to confirm the positive sampling and determine the type of contamination; he sends an updated report. Upon confirmation of the sample, the squad with the positive sample is designated by the platoon leader as the base vehicle; its direction of movement becomes the reconnaissance direction of travel. The platoon leader also designates the initial near side line from the base vehicle's last negative sample location. The platoon leader then sends an NBC-4 report to his commander. This report includes type of agent, location, and time.

Upon report of a positive sample, all elements of the platoon halt in place and await confirmation of the sample. Once this is completed, the platoon leader reorganizes the platoon to conduct reconnaissance to define the boundaries of the contaminated area. This operation requires a single three-vehicle team (organized around the base vehicle's team) that includes either the platoon

Figure A-11



A-33

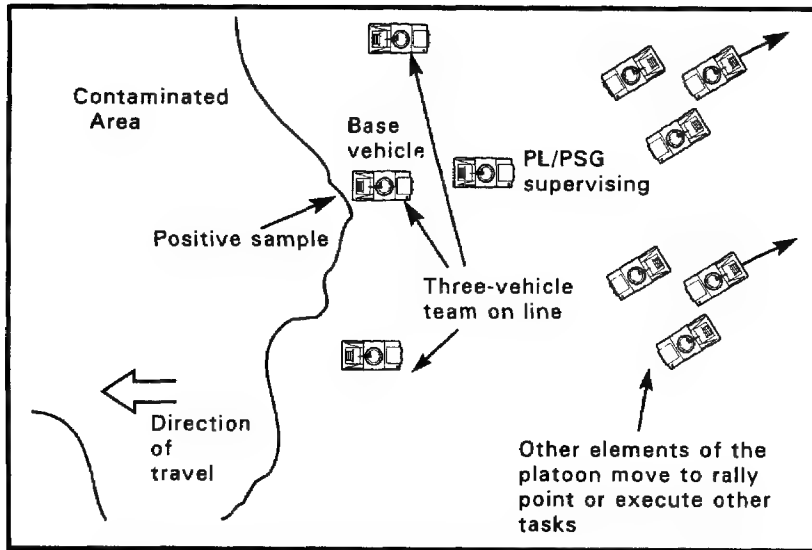


Figure A-11. Platoon conducts reconnaissance of a contaminated area.

The process used to ensure that the contaminated area is completely reconnoitered is fairly complicated and requires flawless execution. Therefore, detailed rehearsals are absolutely essential. The process includes these steps:

- The reconnaissance team assumes a team line formation with the base vehicle in the center.
- The base vehicle moves in bounds and takes a sample every 200 meters. The vehicle commander resets the M8A1 after every bound, if applicable. The vehicle moves across the contaminated area in the direction of travel until taking a negative sample (this establishes the baseline). When a negative is reported, the following actions take place:
 - The vehicle commander rechecks to verify the negative sample.
 - The base vehicle bounds 200 additional meters and takes another sample.
 - If the new sample is negative, the base vehicle halts and reports to the platoon leader or PSG.

- If the sample is positive, the base vehicle continues until receiving two consecutive negative samples.
- The platoon leader or PSG designates the initial far side limit at the second consecutive negative sample (see [Figure A-12](#) page A-36).
- Left and right wing vehicles bound and sample every 200 meters in the direction of travel until they take a positive sample or reach the initial far side limit.
- If a wing vehicle takes a positive sample, the vehicle commander rechecks it and reports to the platoon leader/PSG. The following actions take place, as directed by the vehicle commander:
 - Step A. The driver turns 90 degrees away from the baseline, moves 200 meters, and takes a sample.
 - Step B. If the new sample is negative, the driver turns 90 degrees back to the direction of travel and continues to bound and sample every 200 meters until again receiving a positive sample or reaching the initial far side limit. If the vehicle receives another positive sample, the vehicle commander repeats Step A.
 - Step C. If the new sample is positive, the driver turns 90 degrees again, now opposite the direction of travel, and then continues to bound and sample every 200 meters until receiving a negative sample. If this movement takes the vehicle past the initial far side limit, the platoon leader or PSG adjusts the near-side limit back through the new negative sample location. The vehicle then repeats Step A.
- Once the wing vehicles reach the far side limit, they report to the platoon leader or PSG. The following actions take place:
 - Step A. The platoon leader or PSG projects a line from each wing vehicle location back to the near side line and designates these as the initial left and right limits.
 - Step B. The platoon leader or PSG directs wing vehicles to turn 90 degrees back toward the baseline and sample every 200 meters along the initial far side limit until reaching the base vehicle.

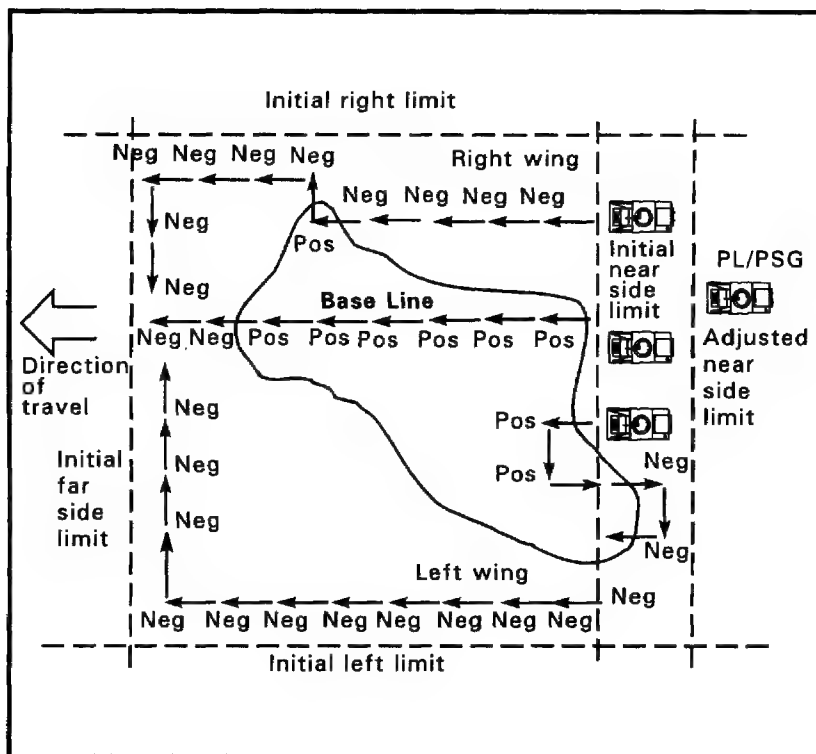


Figure A-12. Platoon designates far side limit and adjusts near side limit.

Step C. If all samples are negative, the team has boxed in the contaminated area and the reconnaissance is complete. It skips steps D through J and begins the concluding process.

Step D. If a wing vehicle receives a positive sample, the commander backs up to his last negative sample location, turns 90 degrees back in the direction of travel, moves 200 meters, and samples.

Step E. If the sample is negative, the vehicle commander repeats steps B, C, and D until reaching the base vehicle. In this case, the base vehicle must also bound and sample in the direction of travel for each bound of the wing vehicles (see [Figure A-13](#)). The platoon then skips step F through J and begins the concluding process.

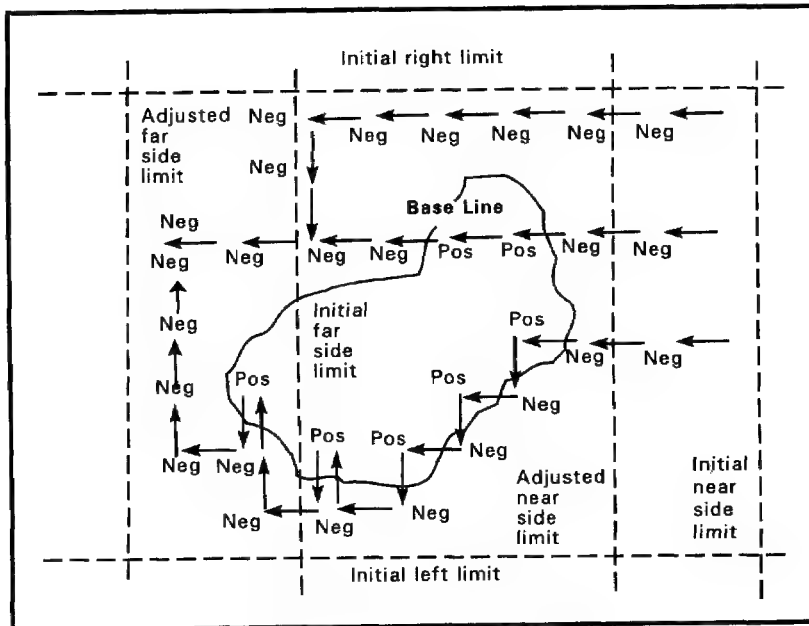


Figure A-13. Adjusting the far side limit.

- Step F. If the sample is positive, the vehicle commander directs his driver to turn 90 degrees away from the baseline, bounds, and samples every 200 meters until receiving a negative sample.
- Step G. The vehicle commander then directs the driver to turn 90 degrees back in the direction of travel, bounds 200 meters, and samples (see [Figure A-14](#), page A-38).
- Step H. If the new sample is negative, the vehicle commander repeats the process starting with Step B.
- Step I. If the sample is positive, the vehicle commander repeats the process starting with step F.
- Step J. The platoon leader or PSG adjusts the initial far side limit and the respective initial right or left limit farther out (not in) for every bound of the wing vehicles. The team has now boxed in the contaminated area.

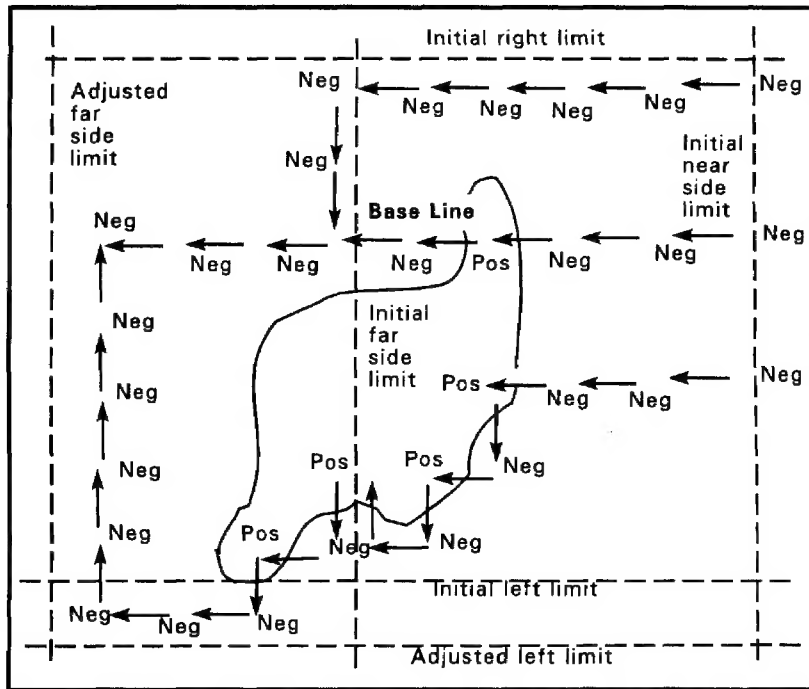


Figure A-14. Adjusting the initial wing lines.

- Concluding process. Once the contaminated area is located and its limits determined, the reconnaissance team takes the following actions:
 - The platoon leader or PSG sends a follow-up NBC 4 report, including type of agent, locations of the four box corners, and time.
 - The platoon leader or PSG recommends a suitable bypass to the commander.
 - The team marks the area and bypass with appropriate tactical markings or VS-17 panels. Chem lights can be used to mark the area during periods of limited visibility.
 - The team conducts hasty decontamination, if required.

- The team may be directed to conduct a screen mission for security or to provide guides to assist in the bypass of the contaminated area.
- If no further tasks are required of the team, it can move to a deliberate decontamination site, if required.

SECURITY

Screen missions are not usually conducted in known contaminated areas. However, an area may become contaminated after the platoon has already occupied it. The enemy may contaminate an area with two general categories of chemicals: persistent or nonpersistent.

The use of persistent chemicals may indicate that the enemy force does not plan to move through that area; this should prompt the platoon to reposition out of the contaminated area and to begin decontamination.

The use of nonpersistent chemicals should trigger maximum alertness on the part of the scout platoon. Nonpersistent chemicals may signal that the enemy is attempting to degrade friendly combat capability prior executing an offensive action. In addition, the enemy may use nonpersistent chemicals to degrade the scouts' performance during a screen mission.

To ensure maximum readiness, OPs must be positioned and occupied in such away that they can react quickly to a chemical attack. These preparations include the following:

- Position M8A1 alarms to cover both the OP site and the hide position (see [Figure A-15](#), page A-40).
- Ensure soldiers at the OP have complete MOPP equipment regardless of MOPP status.
- Ensure that both the OP and vehicle teams have a complete set of NBC equipment, to include M8 paper, M9 paper, M256 chemical agent detector kits, M8A1 alarms, M13 decontamination apparatus, M258A1 personal decontamination kit, and Mark I NAAKs.

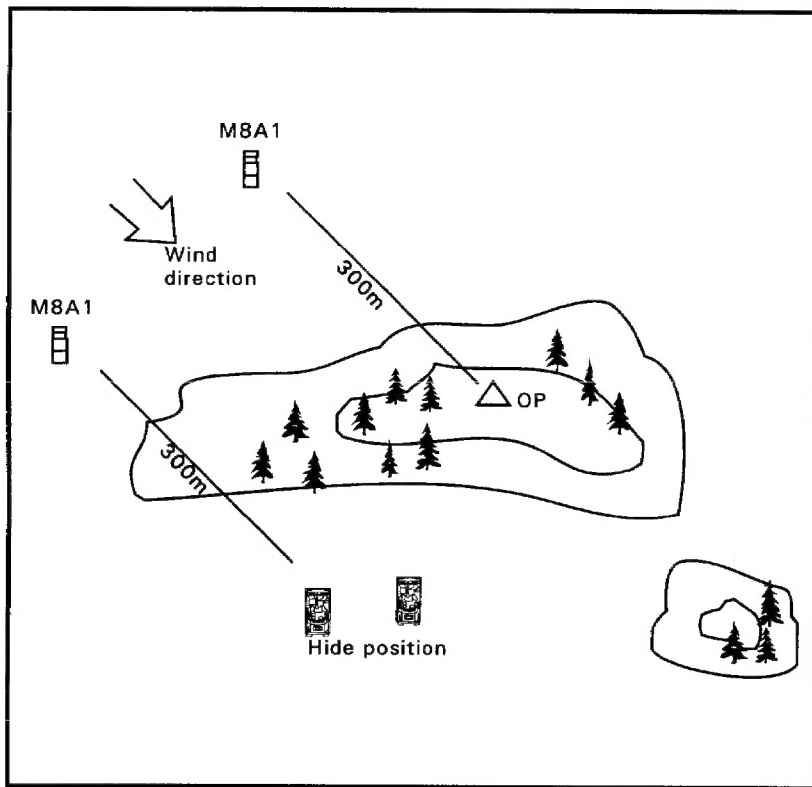


Figure A-15. Positioning M8A1 alarms to support an observation post.

These precautions are necessary for several reasons: the OP may be the first element to experience and react to a chemical attack; there may not be time to obtain needed equipment from the vehicles; and the tactical situation could cause the OP and vehicle teams to become separated. In the event of a chemical attack, the following actions must occur at the OP (see [Figure A-16](#)):

- All personnel go to MOPP 4.
- All dismounted personnel, except OP teams, mount.
- Vehicles button up and start.
- Appropriate reports are sent to higher headquarters as quickly as possible.

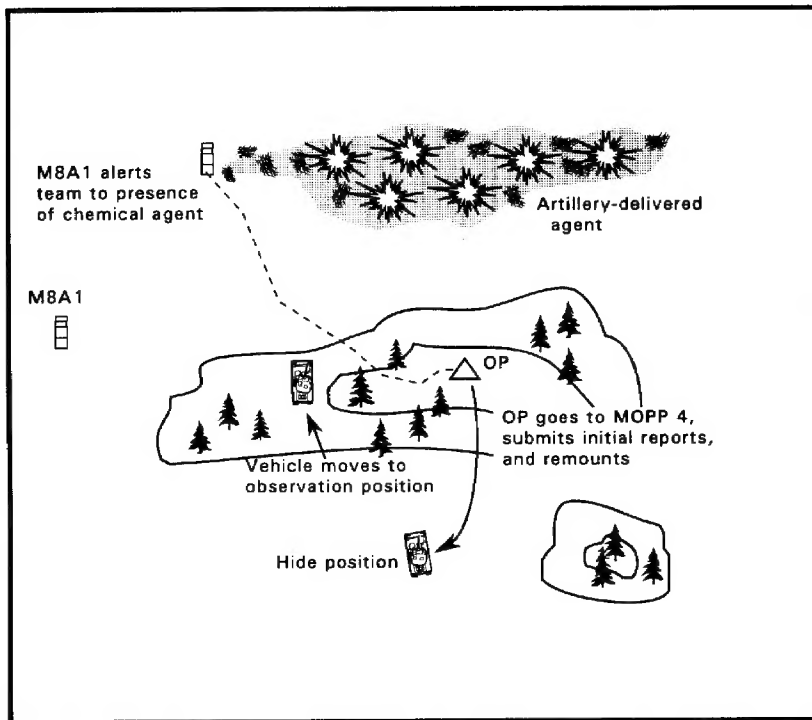


Figure A-16. Observation post reacts to chemical attack.

The team leader must evaluate the situation and decide if it is appropriate to mount the OP team and move vehicles into observation positions as mounted OPs. He bases this decision on a number of factors. As a minimum, he must consider and evaluate the following:

- What is the enemy situation? Is the OP currently in contact? Is it receiving indirect fire?
- Is there effective cover and concealment for the vehicles?
- What are the visibility conditions?

Once the team leader makes his decision, he reports his recommended course of action to the platoon leader and continues to execute the screen mission in accordance with the platoon plan.